Pollution Prevention Metrics

Promoting Activity Accountability and Managing Environmental Improvements at CNRSW

National Defense Industrial Association (NDIA)

30th Environmental and Energy Symposium & Exhibition

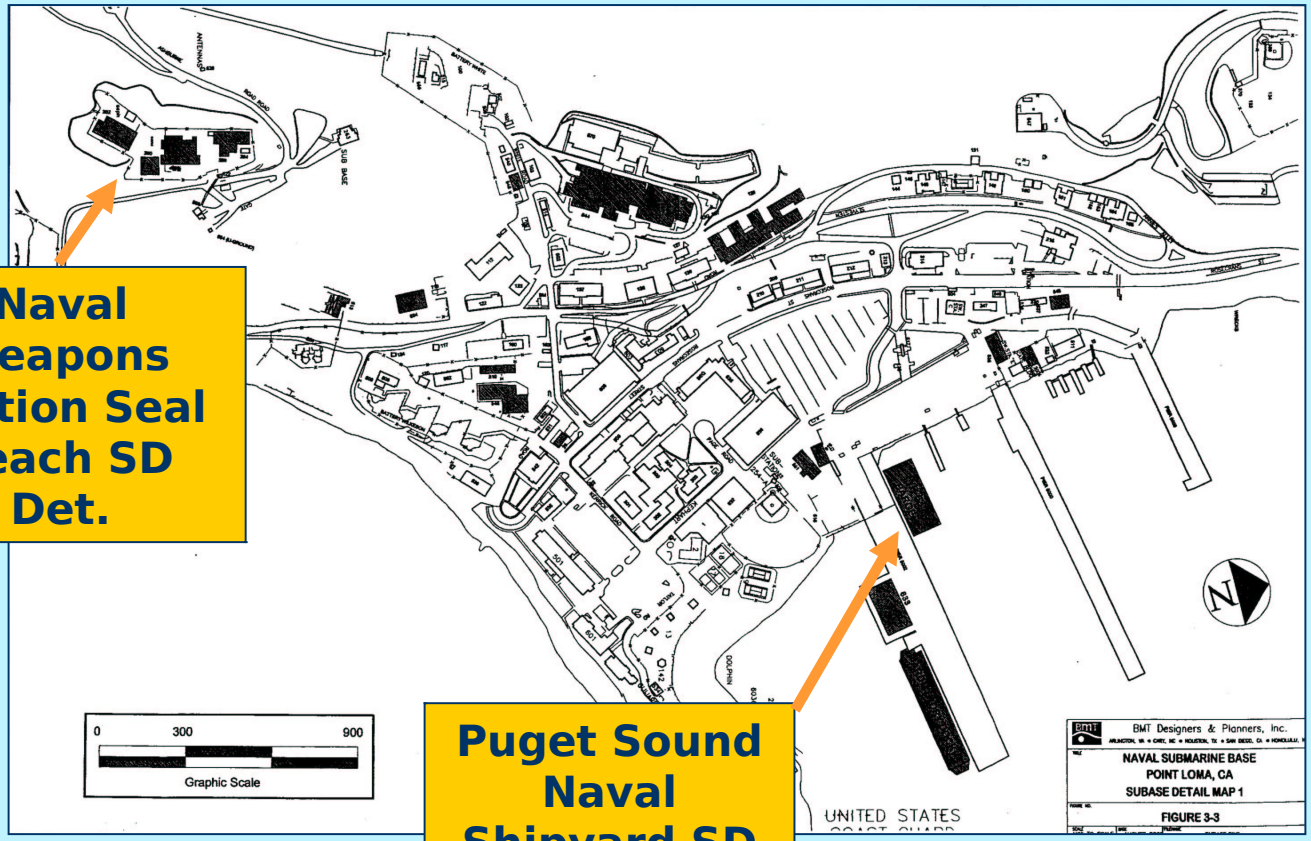
April 7, 2004

Delphine Lee, BMT Designers & Planners

Ed Bonnes, CNRSW Environmental

Naval Base Point Loma, San Diego, CA

Naval Weapons Station Seal Beach SD Det.



Puget Sound Naval Shipyard SD Det.

Hazardous Waste Generation (Shore Activities) in 2001 ~ 327,000 lbs

Activity Name
710th Army EOD
ARCO Dry Dock
CDU
CSS-11
EODTEU-1
FCTC PAC
FISC Fuel Farm
FASW Training Center
HAZMAT Facility
NWS SB SD Det.
Magnetic Silencing Facility
MK-7
MWR Auto Hobby Shop
Navy Construction Battalion
NEX Autoport SUBASE
NEX Autoport – Nimitz
NHRC
SUBTRAFAC
Pistol Range
PSNS NRMD
PSNS Projects Group
NBPL Env. Site Team
Port Operations
PWC Recurring Maint.
PWC Asbestos & Lead
PWC Technical Services
PWC Electrical Utilities
PWC Civil Utilities
BOWTS
SIMA SSMD
SUBASE Ops
USCG Cutters
US Navy Sailing Center

Traditional P2 Review, Example #1

Puget Sound Naval Shipyard, San Diego Detachment

Processes	Possible PPEP Equipment	Hazardous Waste Reduction
• Battery Well Cleaning		
• Pipe / Heat Exchanger Flushing		
• Radiological Testing		
• Sand Blasting →	Blast Booth →	0 lbs

Total Hazardous Waste Reduction = 0 lbs

Traditional P2 Review, Example #2

Naval Weapons Station Seal Beach San Diego Detachment

Processes	Possible PPEP Equipment	Hazardous Waste Reduction
• Torpedo Flushing		
• Touchup Painting		
• Parts Cleaning →	Aqueous Parts Washer →	1,800 lbs

Total Hazardous Waste Reduction = 1,800 lbs

Pollution Prevention Metrics

Activity	Description	Quantity	Unit Cost	State Code	State Code2	Profile No.	Pickup Date
	TOXIC, SOLID, DEBRIS, NON LISTED (PAPER, PLASTIC, METAL, CARDB	3	0.44	352		HT45	12-Apr-01
	AEROSOLS, IGNITABLE	4	2.24	214		HE11	17-May-01
	POL - RECYCLED	71	0.44	221		RP12	17-May-01
70TH ORD DET SUBASE	POL,	36	2.24	214		HP51	03-May-01
70TH ORD DET SUBASE	OIL W	10	0.44	223		HP22	23-Mar-01
710 EOD SUBASE	IGNIT	6	2.24	352		HI12	28-Nov-01
710 EOD SUBASE	AERO	5	2.24	214		HE11	28-Nov-01
P.S.N.S. SUBASE	TOXI			352		HT45	21-Mar-01
P.S.N.S. SUBASE	ACIDS			792		HA51	19-Mar-01
P.S.N.S. SUBASE	TOXICS, LIQUID CONTAINING METALS, OILS, SOLVEN			722	134	HT11	12-Jan-01
P.S.N.S. SUBASE	TOXIC, SOLID, DEBRIS, NON LISTED (PAPER, PLASTI			352		HT45	23-Mar-01
P.S.N.S. SUBASE	IGNITABLE, SOLVENT BASED PAINTS			461		HI11	30-May-01
MK-48 SUBASE	AEROSOLS, NON-IGNITABLE			741		HE21	29-Mar-01
MK-48 SUBASE	TOXIC, SOLID, DEBRIS, NON LISTED (PAPER, PLASTI			352		HT45	29-Mar-01
MK-48 SUBASE	TOXIC, SOLID, DEBRIS, NON LISTED (Debris, Filters, Paint Chips, Floure	5	0.44	352		HT45	16-Aug-01
MK-48 SUBASE	TORPEDO AUTOFUEL	43547	0.7	342		HW?	01-Jan-01
MK-48 SUBASE	TOXIC, SOLID, DEBRIS, NON LISTED (Debris, Filters, Paint Chips, Floure	10	0.44	352		HT45	20-Jul-01
MWR AUTO HOBBY SB	TOXIC, ETHYLENE GLYCOL					HT12	10-Jul-01
MWR AUTO HOBBY SB	OXIDIZER, GENERAL					HO71	08-Jan-01
MWR AUTO HOBBY SB	AEROSOLS, IGNITABLE					HE11	10-Jul-01
MWR AUTO HOBBY SB	GASOLINE FILTERS					HI14	25-May-01
MWR AUTO HOBBY SB	TOXIC, ETHYLENE GLYCOL					HT12	25-May-01
ARCO	POL - RECYCLED					RP12	12-Mar-01
ARCO	TOXIC, SOLID, BATTERIES, ALKALINE, CARBON ZINC					HT31	01-Aug-01
ARCO	TOXICS, LIQUID CONTAINING METALS, OILS, SOLVENTS AND FUELS	1108	1.7			HT11	14-May-01
ARCO	IGNITABLE, SOLVENT BASED PAINTS	740	2.24			HI11	14-May-01
ARCO	IGNITABLE, SATURATED PAINT DEBRIS/FUEL DEBRIS	42	2.24			HI12	14-May-01
ARCO	TOXIC, SOLID, DEBRIS, NON LISTED (Debris, Filters, Paint Chips, Floure	1000	0.44			HT45	02-Jul-01
ARCO	TOXIC, SOLID, ASBESTOS	35	0.44				ay-01
ARCO	TOXIC, SOLID, DEBRIS, NON LISTED (Debris, Filters, Paint Chips, Floure	7	0.44	352			ec-01
ARCO	IGNITABLE, SATURATED PAINT AND ADHESIVE DEBRIS AND ABSORB	167	2.24	352			ec-01
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ARCO	TOXIC, SOLID, DEBRIS, NON LISTED (Debris, Filters, Paint Chips, Floure	223	0.44	352			ec-01
ARCO	TOXIC, SOLID, DEBRIS, NON LISTED (Debris, Filters, Paint Chips, Floure	19	0.44	352		HT45	14-Dec-01
ARCO	IGNITABLE, SOLVENT BASED PAINTS	24	2.24	461		HI11	
ARCO	TOXICS, LIQUID CONTAINING METALS, OILS, SOLVENTS AND FUELS	1803	1.7	722	134	HT11	
ARCO	REACTIVES, OXYGEN BREATHING APPARATUS (OBA) CANISTERS	13	2.24	181		HR41	
ARCO	TOXICS, LIQUID CONTAINING METALS, OILS, SOLVENTS AND FUELS	587	1.7	722	134	HT11	
ARCO	TOXIC, SOLID, DEBRIS, NON LISTED (Debris, Filters, Paint Chips, Floure	192	0.44	352		HT45	
ARCO	IGNITABLE, SOLVENT BASED PAINTS	102	2.24	461		HI11	
ARCO	TOXIC, SOLID, DEBRIS, NON LISTED (Debris, Filters, Paint Chips, Floure	50	0.44	352		HT45	
ARCO	AEROSOLS, IGNITABLE	15	2.24	214		HE11	01-Aug-01

Activity

Waste Description

Quantity of Waste Disposed

EPA and State Waste Codes

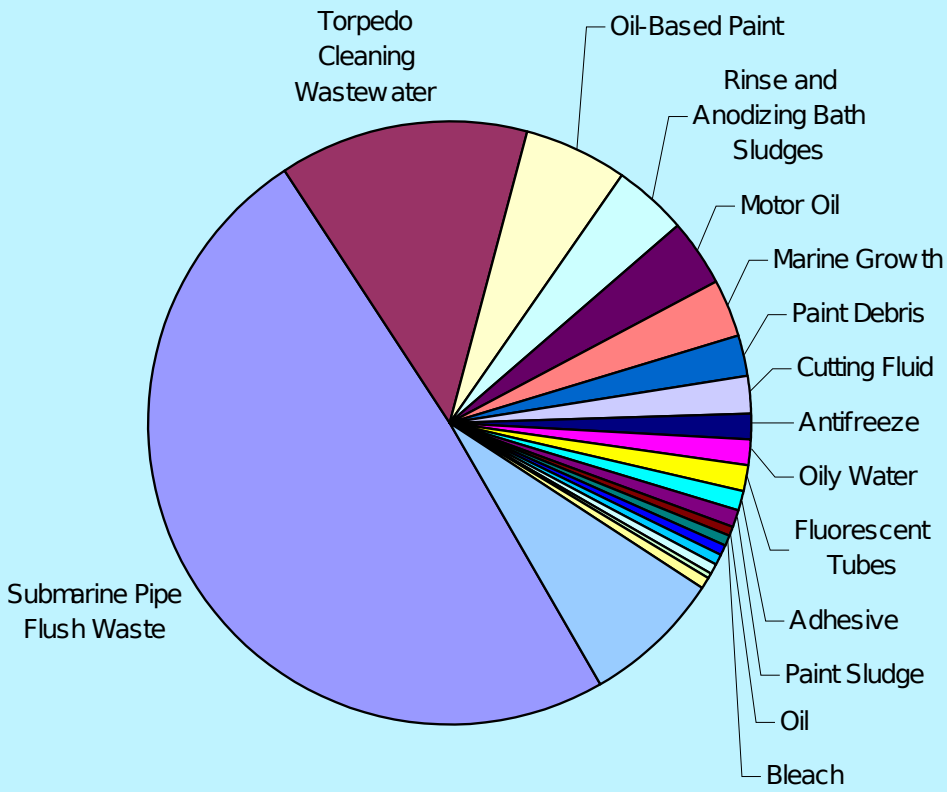
Unit Cost for Disposal

Method of Disposal

Waste Pickup Date

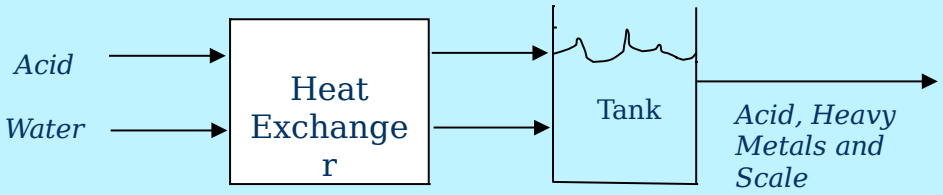
Prioritizing P2 Efforts by Waste Stream

#	Waste Streams at NBPL	Quantity Generated in 2001 (lbs)
1	Submarine Pipe Flush Waste	160,664
2	Torpedo Cleaning Wastewater	43,547
3	Oil-Based Paint	17,865
4	Rinse and Anodizing Bath Sludges	13,000
5	Motor Oil	12,130
6	Marine Growth	9,160
7	Paint Debris	7,649
8	Coolant / Cutting Fluid	6,001
9	Antifreeze	4,988
10	Oily Water	4,727
11	Fluorescent Tubes	4,630
12	Adhesive	3,207
13	Paint Sludge	2,706
14	Oil	2,085
15	Bleach	1,950
16	NiCad Batteries	1,745
17	Asbestos	1,659
18	Solid Media Blast Waste	1,594
19	Battery Well Cleaning Wastewater	1,554
20	Lubricant	1,507



Targeting the Largest Hazardous Waste Stream

Current Process

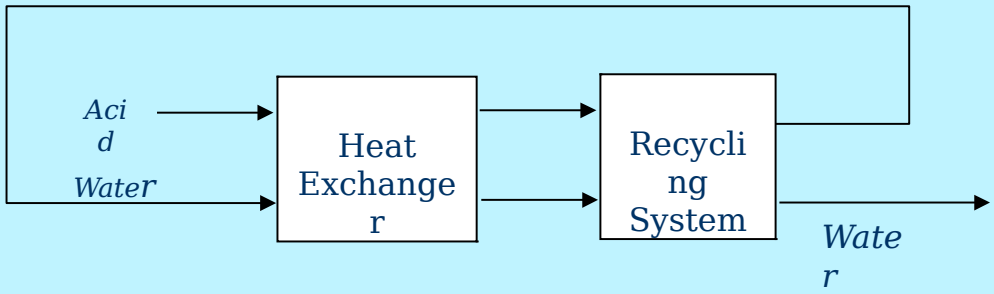


Hazardous Waste Disposal

15,000 gal / sub

$32 K / year

Proposed Process



Labor Savings

50 hours

10 peo / crew

$80 / person

$40 K / sub

$80 K / year

Hazardous Waste Reduction: 160,000 lbs/yr

Savings: $100 K / yr

Prioritizing P2 Efforts by Waste Stream

#	Waste Streams at NBPL	Quantity Generated in 2001 (lbs)
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2	Torpedo Cleaning Wastewater	43,547
3	Oil-Based Paint	17,865
4	Rinse and Anodizing Bath Sludges	13,000
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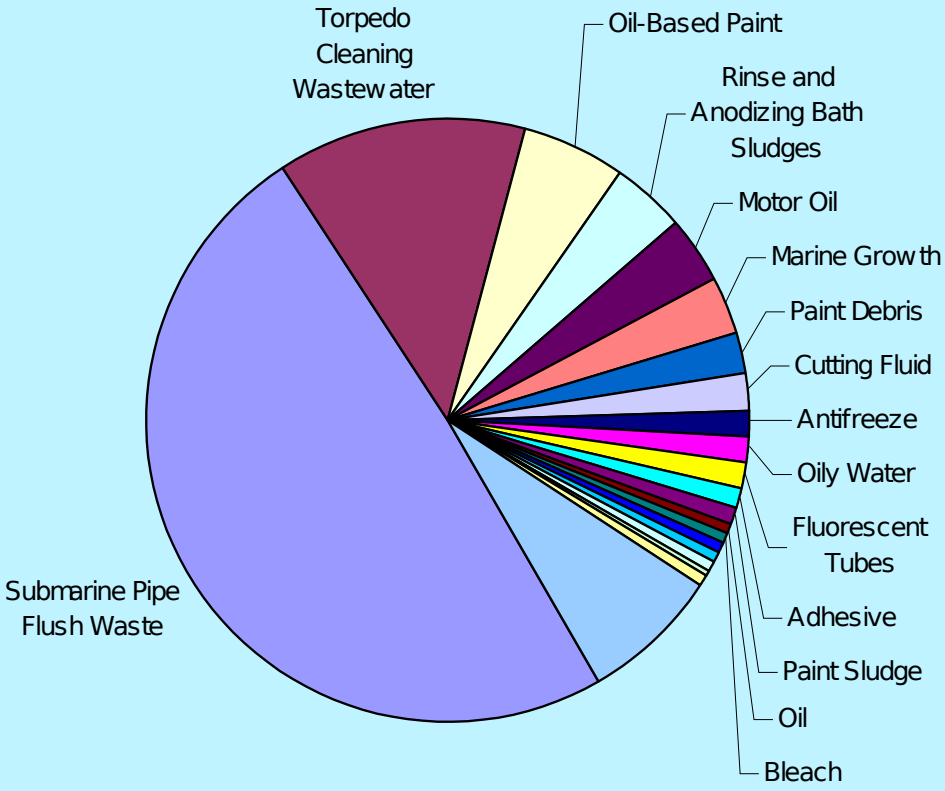
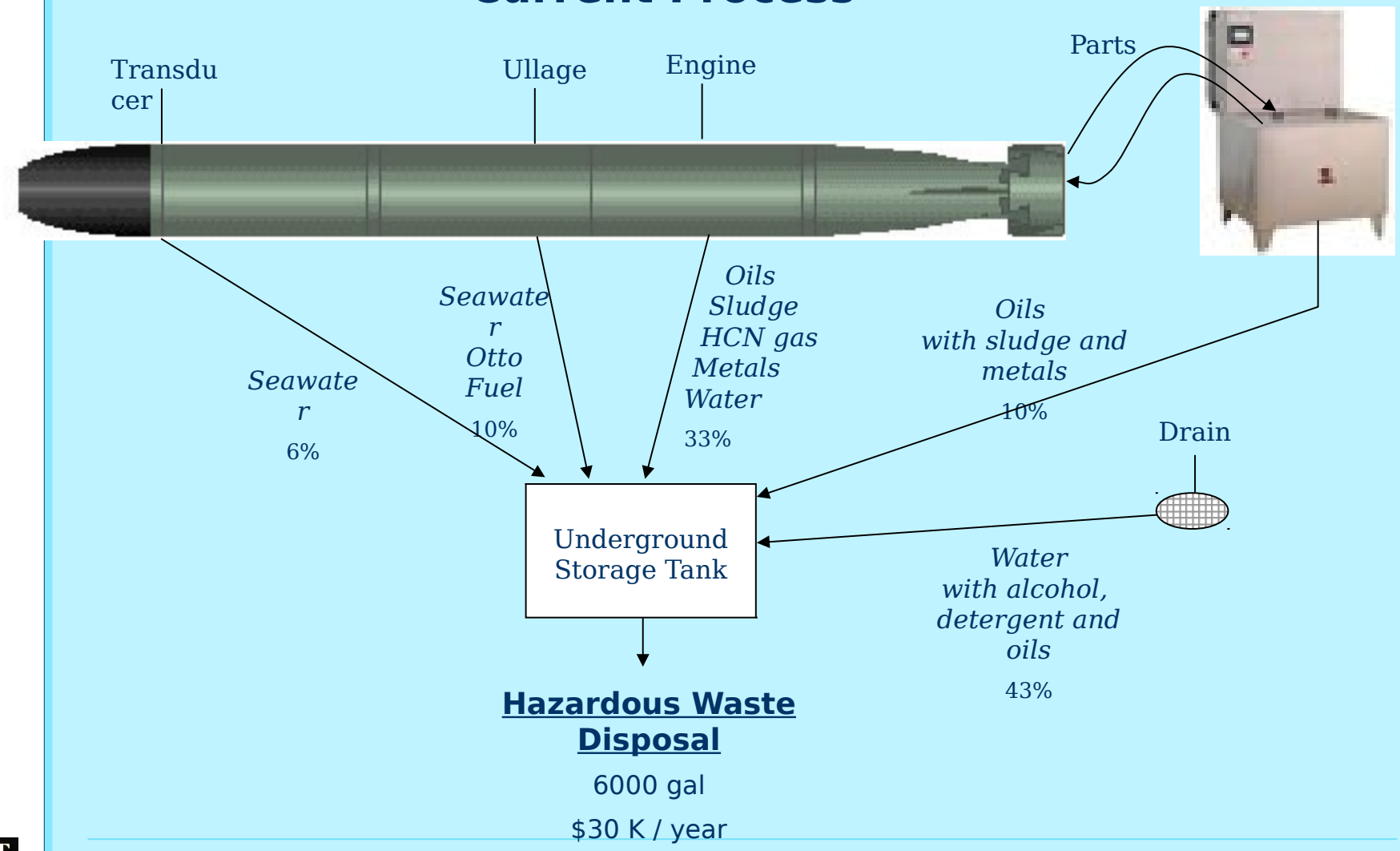


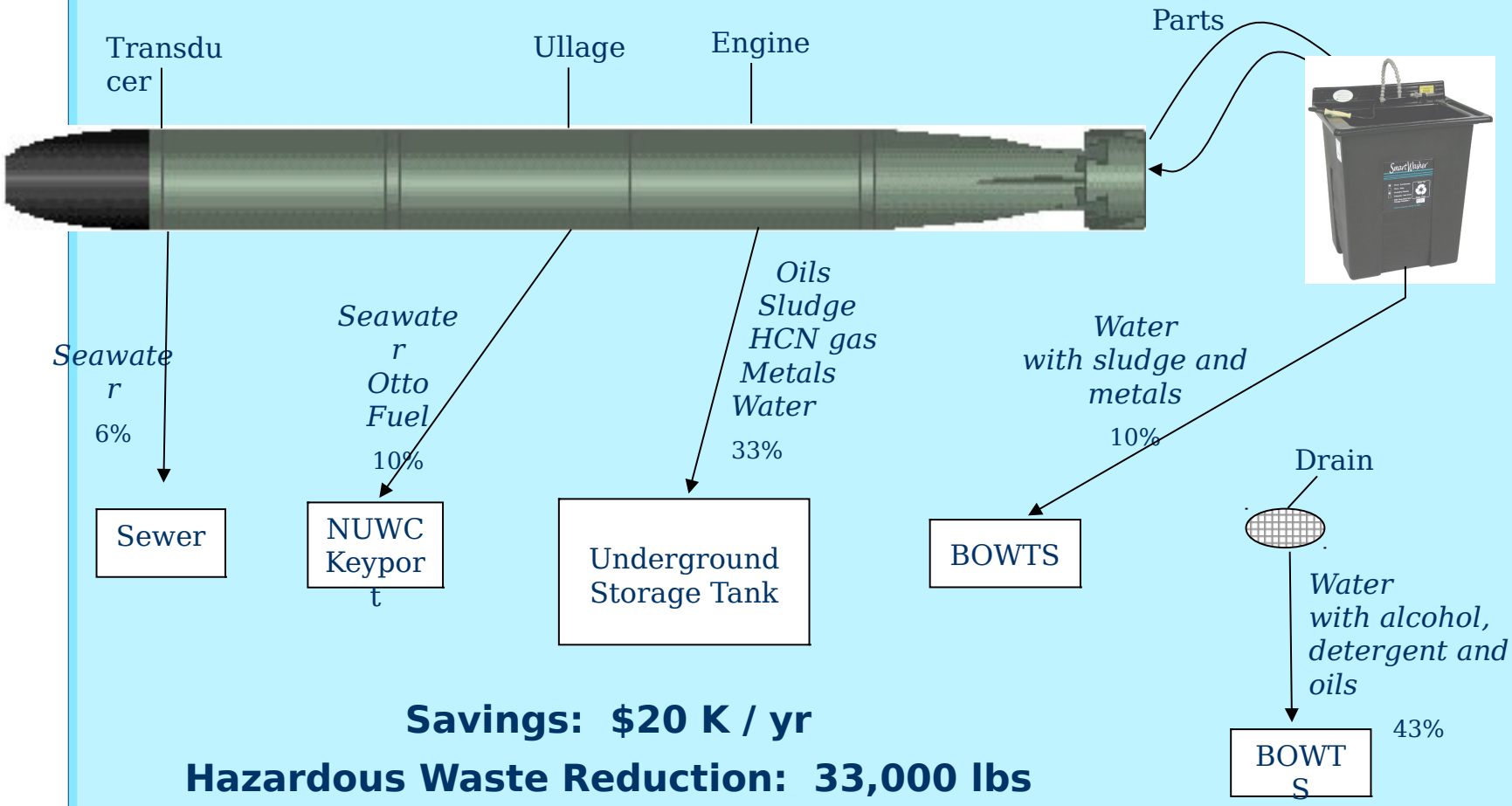
Targeting the Second Largest Waste Stream

Current Process



Targeting the Second Largest Waste Stream (Con't)

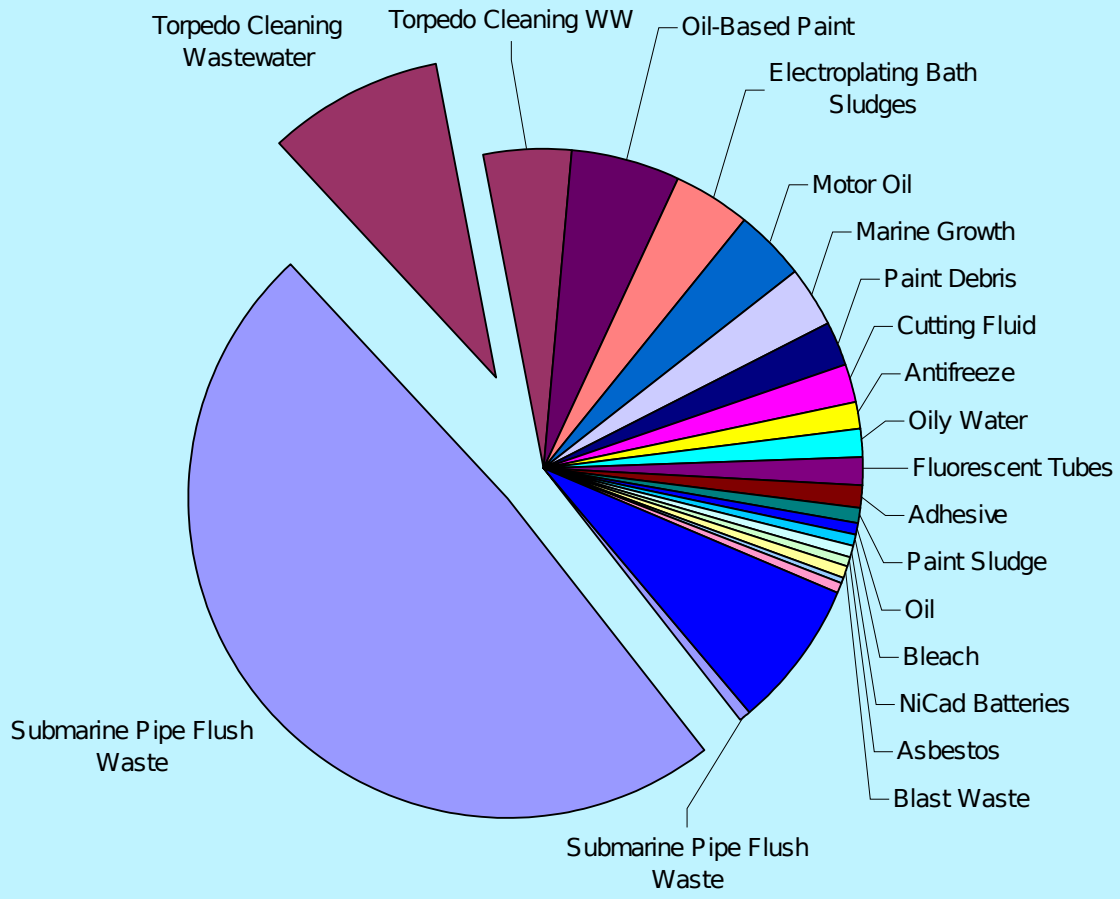
Proposed Process



Savings: $20 K / yr

Hazardous Waste Reduction: 33,000 lbs

Results of P2 Efforts



70% Hazardous Waste Reduction

Making Activities Accountable

Activity	Description	Quantity	Unit Cost	State Code	State Code2	Profile No.	Pickup Date
	TOXIC, SOLID, DEBRIS, NON LISTED (PAPER, PLASTIC, METAL, CARDB	3	0.44	352		HT45	12-Apr-01
	AEROSOLS, IGNITABLE	4	2.24	214		HE11	17-May-01
	POL - RECYCLED	71	0.44	221		RP12	17-May-01
70TH ORD DET SUBASE	POL,	36	2.24	214		HP51	03-May-01
70TH ORD DET SUBASE	OIL W	10	0.44	223		HP22	23-Mar-01
710 EOD SUBASE	IGNIT	6	2.24	352		HI12	28-Nov-01
710 EOD SUBASE	AERO	5	2.24	214		HE11	28-Nov-01
P.S.N.S. SUBASE	TOXI			352		HT45	21-Mar-01
P.S.N.S. SUBASE	ACIDS			792		HA51	19-Mar-01
P.S.N.S. SUBASE	TOXICS, LIQUID CONTAINING METALS, OILS, SOLVEN			722	134	HT11	12-Jan-01
P.S.N.S. SUBASE	TOXIC, SOLID, DEBRIS, NON LISTED (PAPER, PLASTIC			352		HT45	23-Mar-01
P.S.N.S. SUBASE	IGNITABLE, SOLVENT BASED PAINTS			461		HI11	30-May-01
MK-48 SUBASE	AEROSOLS, NON-IGNITABLE			741		HE21	29-Mar-01
MK-48 SUBASE	TOXIC, SOLID, DEBRIS, NON LISTED (PAPER, PLASTIC, METAL, CARDB					HT45	29-Mar-01
MK-48 SUBASE	TOXIC, SOLID, DEBRIS, NON LISTED (Debris, Filters, Paint Chips, Floure					HT45	16-Aug-01
MK-48 SUBASE	TORPEDO AUTOFUEL	43				HW?	01-Jan-01
MK-48 SUBASE	TOXIC, SOLID, DEBRIS, NON LISTED (Debris, Filters, Paint Chips, Floure	1				HT45	20-Jul-01
MWR AUTO HOBBY SB	TOXIC, ETHYLENE GLYCOL	6				HT12	10-Jul-01
MWR AUTO HOBBY SB	OXIDIZER, GENERAL	1				HO71	08-Jan-01
MWR AUTO HOBBY SB	AEROSOLS, IGNITABLE	1				HE11	10-Jul-01
MWR AUTO HOBBY SB	GASOLINE FILTERS	10	2.			HI14	25-May-01
MWR AUTO HOBBY SB	TOXIC, ETHYLENE GLYCOL	211	0.			HT12	25-May-01
ARCO	POL - RECYCLED	314	0.			RP12	12-Mar-01
ARCO	TOXIC, SOLID, BATTERIES, ALKALINE, CARBON ZINC	10	2.			HT31	01-Aug-01
ARCO	TOXICS, LIQUID CONTAINING METALS, OILS, SOLVENTS AND FUELS	1108	1			HT11	14-May-01
ARCO	IGNITABLE, SOLVENT BASED PAINTS	740	2.				ay-01
ARCO	IGNITABLE, SATURATED PAINT DEBRIS/FUEL DEBRIS	42	2.24	352			ay-01
ARCO	TOXIC, SOLID, DEBRIS, NON LISTED (Debris, Filters, Paint Chips, Floure	1000	0.44	352			ul-01
ARCO	TOXIC, SOLID, ASBESTOS	35	0.44	151			ay-01
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Activity

Waste Description

Quantity of Waste Disposed

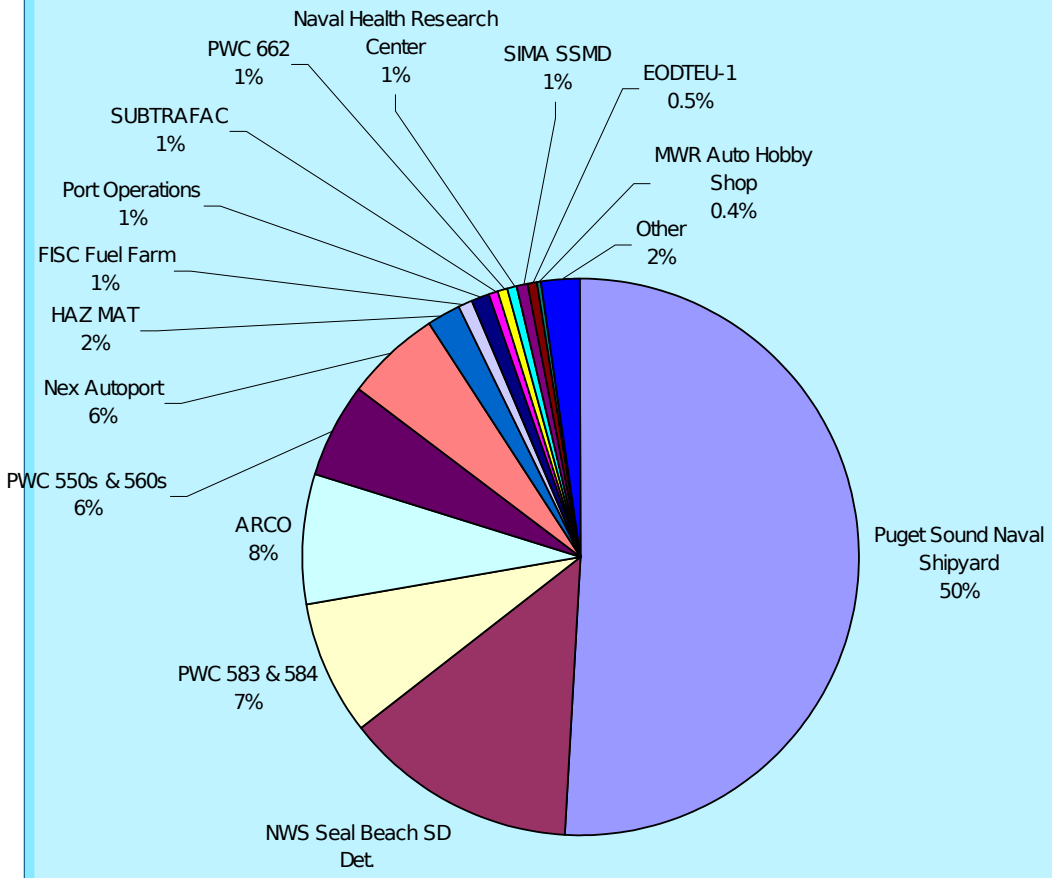
EPA and State Waste Codes

Unit Cost for Disposal

Method of Disposal

Waste Pickup Date

Making Activities Accountable



#	Activity	Quantity Generated in 2001 (lbs)
1	Puget Sound Naval Shipyard SD Det.	166,486
2	NWS Seal Beach SD Det.	44,660
3	PWC 580	25,174
4	ARCO	24,731
5	PWC 550s & 560s	18,213
6	NEX Autoport	18,062
7	SUBASE HAZMINCEN	5,957
8	FISC Fuel Farm	3,267
9	Port Operations	3,236
10	SUBTRAFAC	1,970
11	PWC 576 (SUBASE and ASW)	1,921
12	PWC 662	1,761
13	Naval Health Research Center	1,761
14	SIMA SSMD	1,702
15	EODTEU-1	1,593
16	MWR Auto Hobby Shop	1,223
17	Point Loma Environmental Site Team	1,254
18	Naval Construction Battalion	1,216
19	Pistol Range	863
20	SUBASE Operations	412
21	Fleet ASW	366
22	PWC 920 BOWTS	365
23	Consolidated Divers Unit	337
24	US Navy Sailing Center	158
25	FCTC PAC	144
26	MK-7 DET 81	139
27	70th ORD Det.	124
28	CSS-11 PMT	34
29	SUBRON 11	15
30	710th EOD	11
	Total	**327,001**

Tracking Pollution Prevention Efforts

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2	Torpedo Cleaning Wastewater	$26,600				
3	Oil-Based Paint	$40,000				
4	Rinse and Anodizing Bath Sludges	$22,100				
5	Motor Oil	$5,300				
6	Marine Growth	$15,600				
7	Paint Debris	$17,100				
8	Coolant / Cutting Fluid	$9,400				
9	Antifreeze	$2,900				
10	Oily Water	$100				
11	Fluorescent Tubes	$2,000				
12	Adhesive	$7,200				
13	Paint Sludge	$4,600				
14	Oil	$900				
15	Bleach	$4,400				
16	NiCad Batteries	$3,200				
17	Asbestos	$3,700				
18	Solid Media Blast Waste	$701				
19	Battery Well Cleaning Wastewater	$100				
20	Lubricant	$1,800				

Summary

P2 data were organized in 2 main ways at NBPL:

- By Waste Stream
- By Activity

Developing P2 metrics helped NBPL:

- Focus its efforts on its top 10 waste streams
- Make activities accountable for implementing P2 recommendations
- Track progress towards P2